# AMENDED CLAIMS

[received by the International Bureau on 03 May 2005 (03.05.05);
original claims 1-3 replaced by new claims 1-36 (6 pages)]

1. Magnetic enrichment method, wherein the desired biological component is collected from the solution (23) by means of a magnet (13), which component is thereafter enriched in a liquid, c h a r a c t e r i z e d in

- that by means of the micro particles (22) attached to the magnet (13) or attached by means of at least one magnet at least one biological component is collected in a closed reactor vessel (26, 61),
- and that at least one biological component is enriched in such a manner that the desired component is released to the solution.

2. A method according to claim 1, whereby

- the micro particles (22) containing the desired biological component is collected by means of a magnet (13) from a solution (23) in a vessel (26, 61),
- the collected micro particles (22) are released to a solution,

c h a r a c t e r i z e d in that

- the micro particles (22) with various binding properties are placed in a closed reactor unit (60, 61), where the prevailing conditions are controllable,
- in the reactor unit (60, 61) the possible operations of the enrichment method are carried out,
- the micro particles (22) are collected by means of a magnet unit (10) containing at least one magnet (13),
- in the reactor unit (60, 61) is opened, and
- the collected micro particles (22) is removed from the reactor unit (60, 61) and transferred by means of the magnet unit (10) to another vessel and released in the solution of the vessel.

3. A magnetic synthetizing and modification method, whereby

- components, compunds or polymers of biological or synthetic origin are synthetized, modificated and/or enriched by means of micro particles (22), which are handled by means of a magnet (13) in a closed reactor vessel (26, 61),
- in the reactor vessel (26, 61) enzymatic or chemical reactions are carried out by means of micro particles (22),
- the micro particles (22) are transferred out of the closed reactor vessel (26, 61) and released in another vessel,

c h a r a c t e r i z e d in that

- the micro particles (22) having a proper activity and/or binding properties are placed to a closed reactor unit (60) into a solution (23) or on the surfaces of the reactor vessel (26, 61),
- the solution (23) in the reactor unit (60) is mixed, if needed,
- the desired reaction and/or binding reaction are carried out in the reactor unit (60),
- the micro particles (22) are collected from the solution (23) by means of a magnet unit (10), which includes at least one magnet (13),
- the reactor unit (60) is opened, and
- the micro particles (22) are removed from the reactor unit (60) and transferred by means of the magnet unit (10) into a liquid in another vessel.

4. A method according to claim 1, 2 or 3, c h a r a c t e r i z e d in that the micro particles (22) with desired binding properties are placed into the closed reactor unit (60) so that the micro particles form a thin layer over the magnet unit (10) and/or over the protective membrane (21) of the magnet unit and/or on the inner surface of the reactor unit by means of the magnets placed outside the reactor unit.

5. A method according to any of the claims 1-4, c h a r a c t e r i z e d in that through channels (62) of the reactor unit (60)

- liquid (23) to be handled is rotated out and in and/or
- more sample is brought and/or removed and/or
- are controlled the gases or liquid brought into the reactor unit (60), pH value and salt content and/or the filtering the gases or liquid brought in.

6. A method according to any of the claims 1-5, c h a r a c t e r i z e d in that several reactor units (60) are placed in to an environmental cabinet (70), where the temperatures of the reactor units, rotation speeds of the magnets (13), the protective shields (21) of the magnets or the reactor units, gas exchange, sampling and additions of samples or solutions (23) in the reactor units are controlled.

7. A method according to any of the claims 1-6, c h a r a c t e r i z e d in that the magnet unit (10) of the reactor unit (60) is released from the reactor vessel (26, 61), after which the micro particles (22) are washed and enriched in separate vessels, thus in the released reactor vessel remain all other materials excluding the micro particles and biological components or synthetic compounds or polymers bound to micro particles.

8. A method according to any of the claims 1-7, c h a r a c t e r i z e d in that in the reactor unit (60) the solution (23) and the micro particles (22) are mixed by means of the projections or depressions inside the outer surface of the reactor unit.

9. A method according to any of the claims 1-8, c h a r a c t e r i z e d in that in order to bring about an efficient movement of the solution (23) inside the reactor unit (60) the solution

- is directed between the micro particles (22) and/or
- is directed as a flow passing the magnet unit (10) and/or
- is mixed by means of moving the magnet unit (10) in relation to the walls of the reactor vessel (26, 61) or vice versa and/or
- is pumped inside the reactor unit (60).

10. A method according to any of the claims 1-9, c h a r a c t e r i z e d in that the solution (23) is directed to pass the narrowing (73) and the magnet unit (10) in the middle of the reactor unit (60) by means of rotating the reactor unit around its longitudinal axis or by rocking the reactor unit.

11. A method according to any of the claims 1-10, c h a r a c t e r i z e d in that the solution (23) is mixed by means of a flexible element (75) in the magnet unit (10).

12. A method according to any of the claims 1-11, c h a r a c t e r i z e d in that the solution (23) is mixed by means of pushing downwards the bottom of the tube (26) consisting of stretchy material, whereby pump effect is brought about in the liquid.

13. A method according to any of the claims 1-12, c h a r a c t e r i z e d in that the on the surface of the micro particle (22) is bound any of the following:
protein, antibody, peptide, enzyme, Protein A, Protein G, avidin, streptavidin, biotin, Cibacron blue, proteamine, pepstatin, PEG, lysine, BSA, NTA, EDTA, IDA, polysaccharide, lectin, one- or two-stranded nucleotide sequence, DNA, RNA, mRNA, LNA, PNA, bacteria, virus, yeast or cell.

14. A method according to any of the claims 1-13, c h a r a c t e r i z e d in that the micro particles (22) are used to carry out chromatographic purifying, as ion exchange, reverse phase, hydrofobic or affinity chromatographic purifying.

15. A method according to any of the claims 1-14, c h a r a c t e r i z e d in that by means of the micro particles (22) from different samples are isolated or enriched pathological bacteria, viruses, parasites, protozoans, Salmonella, Listeria, E. Coli O157 and Clostridium.

16. A method according to any of the claims 1-15, c h a r a c t e r i z e d in that by by means of the micro particles (22) are purified DNA, RNA, mRNA, proteins, peptides, cells or cell organelles.

17. Reactor unit (60) for micro particles (22), c h a r a c t e r i z e d in that the reactor unit (60) is a closed vessel (26, 61), which has inside a magnet unit (10) equipped with a shield (21) or coating, and wherein in the vessel the prevailing conditions are controllable.

18. A reactor unit (60) according to claim 17, c h a r a c t e r i z e d in

- that the reactor unit (60) is a closed vessel (26, 61), wherein after closing the prevailing conditions are controllable, and where the micro particles (22) containing the desired biological component are placed, and
- that the closed reactor unit (60) includes a reactor vessel (26, 61), a lid part (33), such as the flange joint for closing and opening the reactor unit, and a magnet unit (10) for collecting the micro particles (22).

19. A reactor unit (60) according to claim 17 or 18, c h a r a c t e r i z e d in that the reactor unit (60) is equipped with channels (62) with closing elements (63), as valves for rotating the liquid to be handled in to and out from the reactor unit.

20. A reactor unit (60) according to claim 17, 18 or 19, c h a r a c t e r i z e d in that inside the reactor unit (60) there are projections, ailerons or depressions in order to to bring about a movement of the solution (23) inside the reactor vessel.

21. A reactor unit (60) according to any of claims 17-20, c h a r a c t e r i z e d in that the shape of the reactor vessel (26, 61) is a sandglass-like structure, whereby the current of the liquid is focused in the narrowest spot of the vessel, where the magnet unit (10) is placed.

22. A reactor unit (60) according to any of claims 17-21, c h a r a c t e r i z e d in that the reactor unit (60) is a bag.

23. A reactor unit (60) according to any of claims 17-22, c h a r a c t e r i z e d in that the reactor vessel (26, 61) is a vessel standing upright with a flexible element (75), by means of

which the surface of the liquid (23) in the vessel is changing and an efficient current inside the vessel is achieved.

24. A reactor unit (60) according to any of claims 17-23, c h a r a c t e r i z e d in that several reactor units (60) are placed in to an environmental cabinet (70), where the temperatures of the reactor units, rotation speeds of the magnets (13), the protective shields (21) of the magnets or the reactor units, gas exchange, sampling and additions of samples or solutions (23) in the reactor units are controlled.

25. A reactor unit (60) according to any of claims 17-24, c h a r a c t e r i z e d in that the reactor unit (60) has a rotatable horizontal axis.

26. A reactor unit (60) according to any of claims 17-25, c h a r a c t e r i z e d in that the magnet unit (10) contains a group of magnet units (41) that includes both a first magnet (13a) magnetized transversely to its longitudinal axis and a small, second magnet (13b) magnetized along its longitudinal axis right in the tip of the magnet unit.

27. Magnet unit (10), c h a r a c t e r i z e d in that

- the magnet unit (10) equipped with a shield (21) or coating is inside the closed reactor unit (60), and
- that the shape and the location of the magnet unit (10) in the reactor unit (60) are adjusted in a preferable manner to collect the desired biological component or to synthetize, modificate and/or enrich components, compounds or polymers being of biological or synthetic origin.

28. A magnet unit (10) according to claim 27 for collecting micro particles (22) in a vessel (26, 61), c h a r a c t e r i z e d in that the magnet unit (10) includes

- at least on magnet (13) for collecting micro particles (22), and
- a lid part (33), such as the flange joint for joining the magnet unit (10) to a reactor vessel (26, 61) so that the lid part and the reactor vessel combine a closed reactor unit (60), wherein is the magnet (13) when the reactor unit is closed.

29. A magnet unit (10) according to claim 27 or 28, c h a r a c t e r i z e d in that the magnet unit (10) includes a ferromagnetic tube (12) for controlling the magnetic field and it effect to the protective membrane (21), where the micro particles (22) are colected.

30. A magnet unit (10) according to claim 27, 28 or 29, c h a r a c t e r i z e d in that the magnet unit (10) is a magnet (13) coated with epoxy, phosphate or nickel coating or equipped with protective shield (21), which is separate hard part or an elastic membrane.

31. A magnet unit (10) according to any of claims 27-30, c h a r a c t e r i z e d in that the magnet unit (10) is placed on any of the sides of the reactor vessel (26, 61).

32. A magnet unit (10) according to any of claims 27-31, c h a r a c t e r i z e d in that the magnet unit (10) contains a group of magnet units (41) that includes both a first magnet (13a) magnetized transversely to its longitudinal axis and a small, second magnet (13b) magnetized along its longitudinal axis right in the tip of the magnet unit.

33. A magnet unit (10) according to any of claims 27-32, c h a r a c t e r i z e d in that the protective membrane (21) of the magnet unit (10) is preformed or flexible on both the transverse magnet (13a) and the longitudinal magnet (13b).

34. A magnet unit (10) according to any of claims 27-33, c h a r a c t e r i z e d in that the protective membrane (21) of the magnet unit (10) includes ridges (29).

35. A magnet unit (10) according to any of claims 27-34, c h a r a c t e r i z e d in that the protective membrane (21) includes a tip (64) for supporting the magnet unit (10) while it is horizontally on its side.

36. A magnet unit (10) according to any of claims 27-35, c h a r a c t e r i z e d in that the magnet unit (10) contains a group of magnet units (41) that includes both a first magnet (13a) magnetized transversely to its longitudinal axis and a small, second magnet (13b) magnetized along its longitudinal axis right in the tip of the magnet unit.